

TABLE M-2
Specifications for Casing, Tubing, and Packer

Ref	Section	Outside Diameter (in)	Depth Interval (feet BGL)	Material	Collapse Resistance (psi)	Internal Yield (psi)	Tensile Strength (lbs)	Maximum External Press (psi)	Maximum Internal Press (psi)	Maximum Tensile Load (lbs)	Safety Factor Collapse	Safety Factor Burst	Safety Factor Tension
	Conductor	20	0-75	94 ppf; 0.403" wall, H-40, STC or Welded	520	1,530	581	NA	NA				
1	Surface	13.375	0-500	61 ppf; J-55; STC	1,540	3,090	595,000	208	1,000	30,500	7.40	3.09	19.51
2	Intermediate (to 3000 feet)	9.625	0-3000	36 ppf; J-55 (or K-55); STC	2,020	3,520	423,000	1,248	1,500	108,000	1.62	2.35	3.92
	The following alternate casing design is suitable for all setting depths from 3000 to 5000 feet. Bold indicates biaxial collapse resistance.												
2	Intermediate (to 5000 feet)	9.625	0-3000	36 ppf; J-55 (or K-55); STC	1,919	3,520	423,000	1,248	1,500	188,000	1.54	2.35	2.25
2			3000-5000	40 ppf; J-55 (or K-55); STC	2,570	3,950	486,000	2,080	1,500	80,000	1.24	2.63	6.08
	The following alternate casing design is suitable for all setting depths from 5000 to 7000 feet. Bold indicates biaxial collapse resistance.												
3	Intermediate (to 7000 feet)	9.625	0-3000	36 ppf; J-55 (or K-55); STC	1,797	3,520	423,000	1,123	1,500	268,000	1.60	2.35	1.58
3			3000-5000	40 ppf; J-55 (or K-55); STC	2,467	3,950	486,000	1,872	1,500	160,000	1.32	2.63	3.04
3			5000-7000	40 ppf; N-80 (or L-80); LTC	3,090	5,750	737,000	2,621	1,500	80,000	1.18	3.83	9.21
4	Long String or Liner	7	0-10600	26 ppf; N-80; (or L-80) LTC	5,410	7,240	519,000	4,493	2,544	312,000	1.20	2.85	1.66
5	Injection Tubing	4.5	0-10600	11.6 ppf; L-80; LTC	6,350	7,780	223,000	2,498	5,000	139,200	2.54	1.56	1.60
	Injection Packer	7 x 4.5	10600	Compression set retrievable double grip carbon steel									

1. Maximum external pressure after cementing 16.4 ppg cement with fresh water inside. Assumed gradient equal to 8.0 ppg. Maximum internal pressure during pressure test at 1000 psi.
2. Maximum external pressure after cementing 16.4 ppg cement with fresh water inside. Assumed gradient equal to 8.0 ppg. Maximum internal pressure during pressure test at 1500 psi.
3. Maximum external pressure after cementing 15.6 ppg cement with fresh water inside. Assumed gradient equal to 7.2 (15.6-8.4) ppg. Maximum internal pressure during pressure test at 1500 psi.
4. Maximum external pressure as in Ref 3. Maximum internal pressure during APT assumes 10.0 ppg brine in 4-1/2" by 7" annulus with 1500 psi surface test pressure.
5. Maximum external pressure during APT with 10.0 ppg brine and 1500 psi test pressure. Maximum internal pressure during stimulation set at 5000 psi